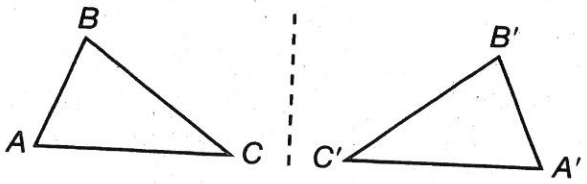
1. Triangle ABC is reflected over a line forming triangle $A'B'C'$.



Suppose triangle ABC is scalene. Which line segment in triangle $A'B'C'$ is the same length as line segment BC?

A. $\overline{A'B'}$

B. $\overline{A'C'}$

C. $\overline{B'C'}$

D. $\overline{C'A'}$

2. Rectangle $JKLM$ has points at $(-2, 2)$, $(1, 2)$, $(1, -2)$, and $(-2, -2)$, respectively. After a transformation of rectangle $JKLM$, rectangle $J'K'L'M'$ is formed with points at $(-1, 1)$, $(2, 1)$, $(2, -3)$, and $(-1, -3)$. Describe the transformation.

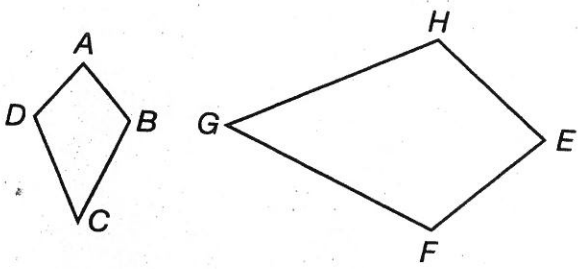
A. Rectangle $JKLM$ was reflected over the origin.

B. Rectangle $JKLM$ was translated 1 unit down and 1 unit to the right.

C. Rectangle $JKLM$ was rotated 90° about point L.

D. Rectangle $JKLM$ was dilated with a scale factor of 1.

3. Kite $ABCD$ is similar to kite $EFGH$.



Which rigid and non-rigid motions could be performed on kite $ABCD$ to produce kite $EFGH$?

A. Rotate 90°, then dilate with a scale factor of 2.

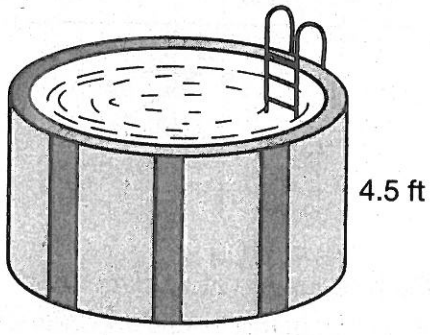
B. Rotate 90°, then dilate with a scale factor of $\frac{1}{2}$.

C. Translate to the left, then dilate with a scale factor of 2.

D. Translate to the right, then dilate with a scale factor of $\frac{1}{2}$.

Go On ▶

4. Nixxi will be sitting on top of the dunk tank at her school's carnival fund-raiser. She wants to find the volume of the tank so she can figure out how much water she will need to fill it. The tank is 4.5 feet deep and has a circumference of approximately 31.4 feet.



What is the approximate volume of the tank? Use 3.14 for π.

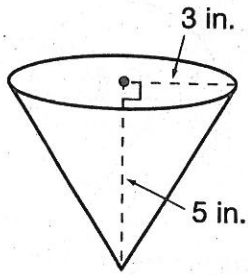
A. 62.8 ft^3

B. 125.6 ft^3

C. 353 ft^3

D. 1,256 ft^3

5. The cone below has a height of 5 inches and a radius of 3 inches.



What is the approximate volume of the cone? Use 3.14 for π.

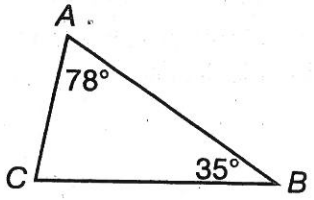
A. 15.7 $in.^3$

B. 47.1 $in.^3$

C. 78.5 $in.^3$

D. 141.3 $in.^3$

6. In triangle *ABC*, the measure of angle *A* is 78 degrees and the measure of angle *B* is 35 degrees.



What is the measure of angle *C*?

A. 67°

B. 70°

C. 77°

D. 102°

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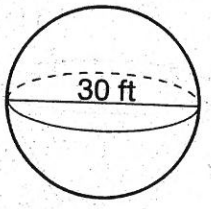
7. The sphere below has a diameter of 30 feet.



Approximately, which is the volume of the sphere? Use 3.14 for π.

A. 10,597 ft^3

B. 13,040 ft^3

C. 14,130 ft^3

D. 87,780 ft^3

8. Jayme drew triangle *LMN* on a coordinate grid. The coordinates of the vertices of triangle *LMN* were (3, 6), (9, 6), and (3, 2), respectively. Jayme then dilated the triangle to produce triangle *L'M'N'*, with vertices whose coordinates were (3, 6), (6, 6), and (3, 4). Which is the scale factor for this dilation?

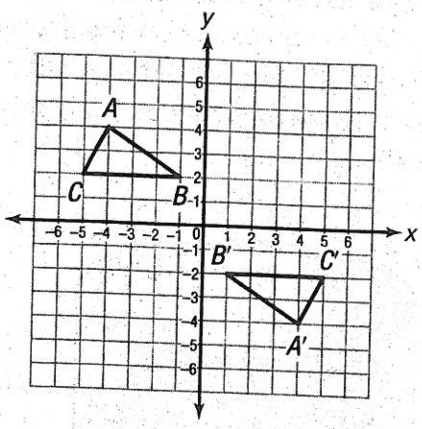
A. $\frac{1}{16}$

B. $\frac{1}{8}$

C. $\frac{1}{4}$

D. $\frac{1}{2}$

9. Triangle *ABC* and triangle *A'B'C'* are shown on the coordinate plane below.



Which sequence of rigid motions shows that triangle *ABC* is congruent to triangle *A'B'C'*?

A. reflection over the *y*-axis, then 180° rotation about the origin

B. reflection over the *y*-axis, then reflection over the *x*-axis

C. reflection over the *y*-axis, then translation of 8 units down

D. reflection over the *y*-axis, then reflection over the origin

10. The Marysville Fire Department was sent to rescue a cat from a tree. The firefighters laid a 25-foot ladder against the tree at a height of 24 feet. How far was the ladder from the tree?

A. 5 ft

B. 6 ft

C. 7 ft

D. 8 ft

Go On ▶

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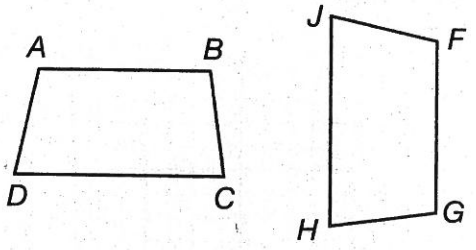
11. Trapezoid *ABCD* is rotated 90 degrees to produce trapezoid *FGHJ*.



Line segment *AB* is parallel to line segment *DC*. Which is true?

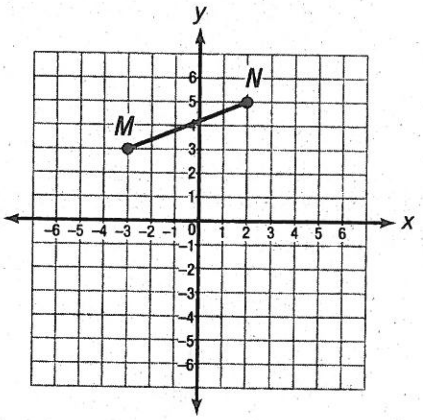
A. $\overline{AB}$ is parallel to $\overline{AD}$.

B. $\overline{AD}$ is parallel to $\overline{BC}$.

C. $\overline{FG}$ is parallel to $\overline{JH}$.

D. $\overline{FJ}$ is parallel to $\overline{GH}$.

12. Below is a graph of line segment *MN*.



What is the length of line segment *MN*?

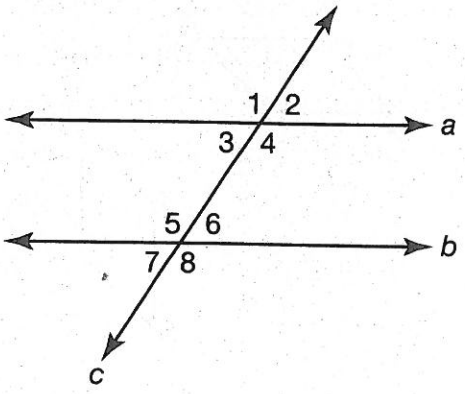
A. 2

B. $\sqrt{5}$

C. 5

D. $\sqrt{29}$

13. Lines *a* and *b* are parallel lines cut by the transversal *c*.



If the measure of angle 5 is 123 degrees, what is the measure of angle 2?

A. 57°

B. 123°

C. 157°

D. 180°

Geometry

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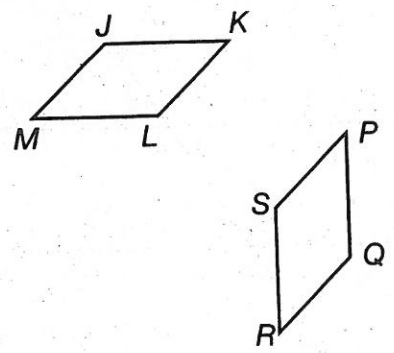
14. Parallelogram *JKLM* and parallelogram *PQRS* are shown below.



Which describes a sequence of rigid motions that show the parallelograms are congruent?

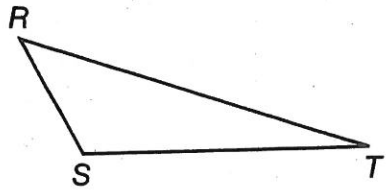
A. reflection, then downward translation

B. dilation by a scale factor of $\frac{1}{2}$, then reflection

C. upward translation, then 90° rotation

D. 90° rotation, then downward translation

15. Triangle *RST* is translated to the right to form triangle $R'S'T'$. The measure of angle *R* is 27 degrees.



What is the measure of angle R'?

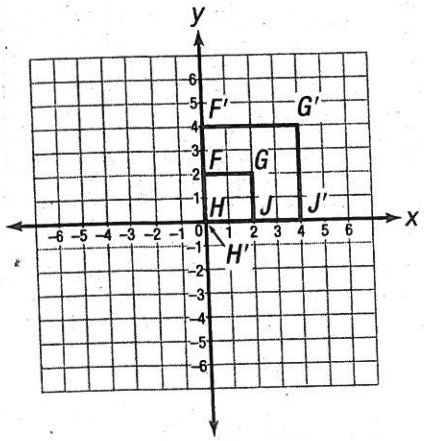
A. 27°

B. 33°

C. 127°

D. 147°

16. Square *FGHJ* was dilated to form square $F'G'H'J'$. The center of dilation was at the origin.



What scale factor was used?

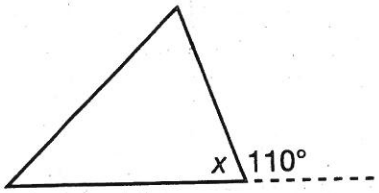
A. $\frac{1}{2}$

B. $\frac{1}{4}$

C. 2

D. 4

17. The triangle below has an exterior angle of 110 degrees.



What is the value of *x*?

A. 70°

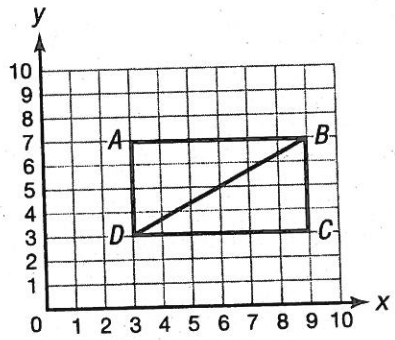
B. 80°

C. 90°

D. 110°

Go On ▶

18. Line segment BD is a diagonal of rectangle $ABCD$.



What is the length of line segment BD?

A. $2.\overline{3}$

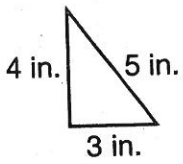
B. 4.4

C. 6.21

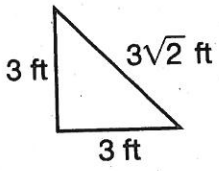
D. $7.2\overline{1}$

19. Which is **not** a right triangle?

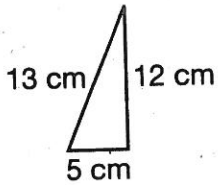
A.



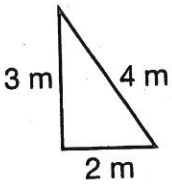
B.



C.



D.



20. Triangle ABC has vertices at $A(0, 4)$, $B(2, 10)$, and $C(8, 8)$ and is dilated by a scale factor of $\frac{1}{4}$, with the origin used as the center of dilation, to produce the image $A'B'C'$. What are the coordinates of the vertices of the dilated image $A'B'C'$?

A. $A'(0, 1), B'(0.5, 2), C'(4, 4)$

B. $A'(0, 1), B'(0.5, 2.5), C'(2, 2)$

C. $A'(1, 1), B'(2, 2), C'(4, 4)$

D. $A'(1, 0), B'(2.5, 2.5), C'(2, 2)$

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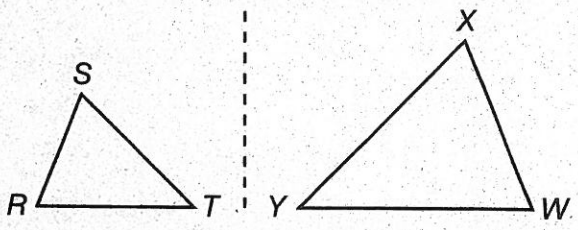
Go On ▶

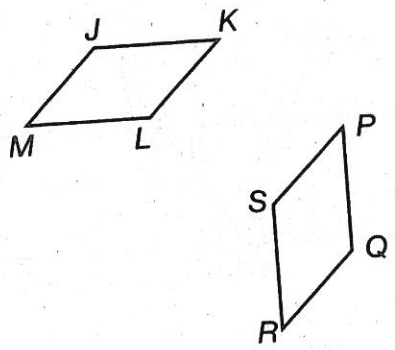
21. Triangle *RST* is similar to triangle *WXY*.



Identify the type of rigid and/or nonrigid motions that are needed to show this.

22. A basketball has a diameter of 29.5 inches. If the basketball is fully inflated, about how many cubic inches of air will it hold? Use 3.14 for π. Show your work.

14. Parallelogram *JKLM* and parallelogram *PQRS* are shown below.



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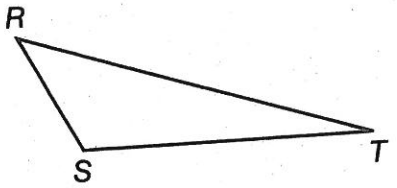

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B. 33°

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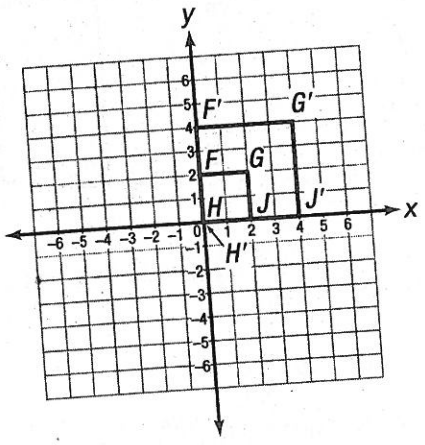


What scale factor was used?

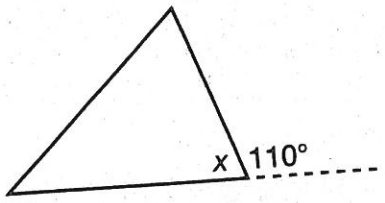
A. $\frac{1}{2}$

B. $\frac{1}{4}$

C. 2

D. 4

17. The triangle below has an exterior angle of 110 degrees.



What is the value of x?

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B. 80°

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D. 110°

Go On ▶

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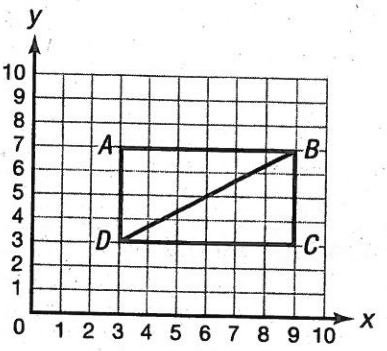

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A. $2.\overline{3}$

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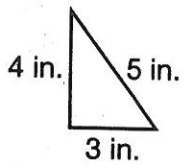
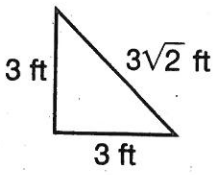
19. Which is **not** a right triangle?

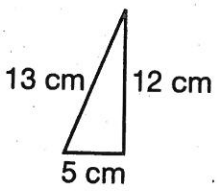
A.



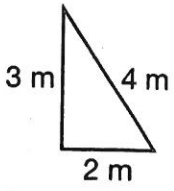
B.



C.



D.



20. Triangle ABC has vertices at $A(0, 4)$, $B(2, 10)$, and $C(8, 8)$ and is dilated by a scale factor of $\frac{1}{4}$, with the origin used as the center of dilation, to produce the image $A'B'C'$. What are the coordinates of the vertices of the dilated image $A'B'C'$?

A. $A'(0, 1), B'(0.5, 2), C'(4, 4)$

B. $A'(0, 1), B'(0.5, 2.5), C'(2, 2)$

C. $A'(1, 1), B'(2, 2), C'(4, 4)$

D. $A'(1, 0), B'(2.5, 2.5), C'(2, 2)$

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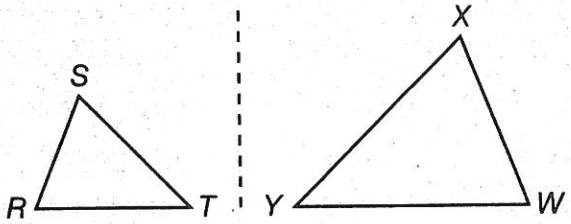
Go On ▶

21. Triangle *RST* is similar to triangle *WXY*.

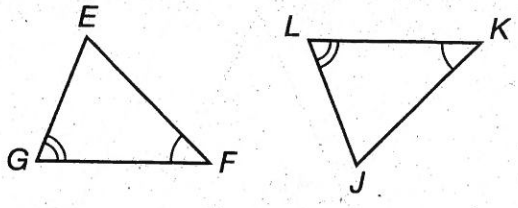


Identify the type of rigid and/or nonrigid motions that are needed to show this.

22. A basketball has a diameter of 29.5 inches. If the basketball is fully inflated, about how many cubic inches of air will it hold? Use 3.14 for π. Show your work.

Go On

23. Triangles *EFG* and *JKL* are shown below.



A. Are the triangles similar? Explain why or why not.

B. Give an example of additional information that could be used to conclude that the triangles are congruent. Explain.

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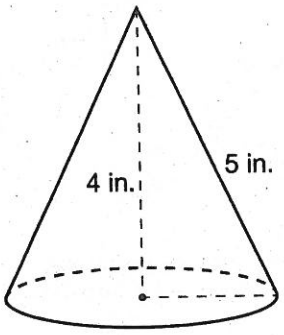
24. The cone below has a slant height of 5 inches and a height of 4 inches.



A. What is the diameter of the base of the cone? Show all work and label your answer with the correct units.

B. What is the volume of the cone? (Hint: $V = \frac{1}{3}Bh$, where B is the area of the base.) Show all work and label your answer with the correct units.

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25. Liam drew a right triangle, triangle *DEF*, with side lengths of 7 inches, 24 inches, and 25 inches.

A. Use the converse of the Pythagorean theorem to prove that triangle *DEF* is a right triangle. Show your work.

B. Use a model to verify the Pythagorean theorem.

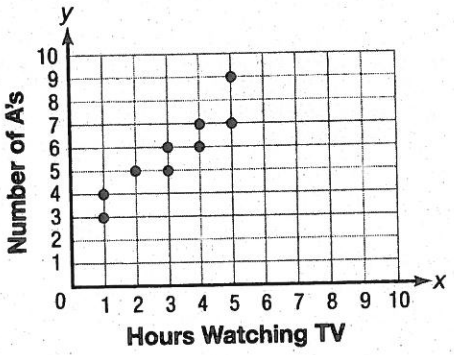
1. Mr. Jain gives his class a quiz every Monday. He randomly surveyed some of his students to see if there was a relationship between weekend hours spent watching TV and quiz scores. Mr. Jain's data are shown in the table below.

Weekend TV Hours and Quiz Scores

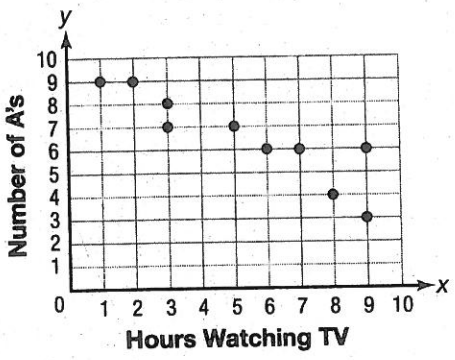
Mean Number of Weekend Hours Watching TV	Number of A's on Quizzes
1	8
3	6
5	4
2	7
1	9
4	6
3	7
1	7
5	3
4	5

Which of the scatter plots below best represents Mr. Jain's data?

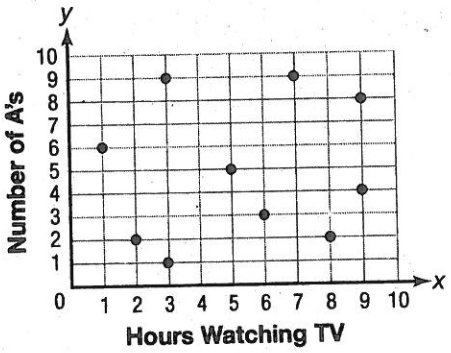
A.



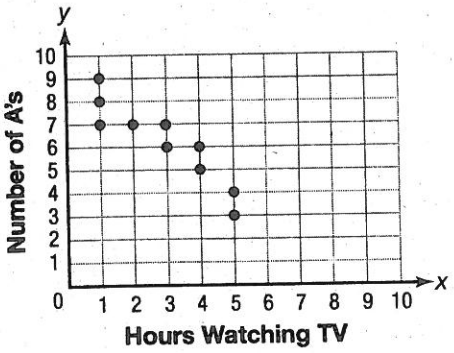
C.



B.



D.



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